In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently amended) A method of fabricating a mask, comprising:

providing material and device data;

defining a first manufacturing model according to the material and the device data;

performing a first process run of a first mask as defined by the first manufacturing model;

collecting a first process data during the first process run;

determining a backward modification data according to the material[[,]] and the device data~~["device" lacks antecedent basis]~~, and the first process data;

modifying the first manufacturing model according to the backward modification data to obtain a second manufacturing model; and

performing a second process run of a second mask as defined by the second manufacturing model.

2. (Original) The method of claim 1, wherein the backward modification data determining step further comprises performing statistical process control analysis.

3. (Original) The method of claim 1, wherein the material data comprises photoresist type, characteristics, production date, post coating decay, or batch relation data.

4. (Original) The method of claim 1, wherein the device data comprises device type, mask layer, mask grade, option correction type, pattern loading or device loading data.

5. (Currently amended) The method of claim 1, wherein the first ~~production~~process data~~["first production data" lacks antecedent basis]~~ comprises exposure tool, etching chamber, etching time, tooling bias, batch relation, or inspection result data.

6. (Original) The method of claim 1, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a writing process for masks.

7. (Original) The method of claim 1, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a baking process for masks.

8. (Original) The method of claim 1, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a developing process for masks.

9. (Original) The method of claim 1, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes an etching process for masks.

10. (Currently amended) The method of claim 1, further comprising:

acquiring an inspection result of a preceding process run, wherein the inspection result is an after-strip inspection result;

determining a forward modification data according to the first ~~production~~ process data~~["first process data"?]~~ and the inspection result;

determining a re-etch manufacturing model according to the forward modification data; and

performing a re-etch process run of the first mask as defined by the re-etch manufacturing model.

11. (Original) A method for controlling mask fabrication using statistical process control analysis, comprising:

defining a manufacturing model;

performing a process run of a mask as defined by the manufacturing model;

performing a fault detection analysis to reduce a bias in the manufacturing model;

generating a fine-tuning signal in response to a result of the fault detection analysis; and

adjusting the process run operation according to the fine-tuning signal.

12. (Original) The method of claim 11, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a writing process for masks.

13. (Original) The method of claim 11, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a baking process for masks.

14. (Original) The method of claim 11, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a developing process for masks.

15. (Original) The method of claim 11, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes an etching process for masks.

16. (Original) The method of claim 11, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes an stripping process for masks.

17. (Original) A mask fabrication system, comprising:

a processing tool for processing a mask;

a metrology tool, interfaced with the processing tool, for inspecting the mask and obtaining an inspection result;

a controller, coupled with the processing and metrology tools, for generating a manufacturing model of the processing tool and calibrating the manufacturing model according to a device data, a material data, and the inspection result of the mask.

18. (Original) The system of claim 17, wherein the controller further performs statistical process control analysis.

19. (Original) The system of claim 17, wherein the material data comprises photoresist type, characteristics, production date, post coating decay, or batch relation data.

20. (Original) The system of claim 17, wherein the device data comprises device type, mask layer, mask grade, option correction type, pattern loading or device loading data.

21. (Original) The system of claim 17, wherein the controller further defines a manufacturing model that describes a writing process for masks.

22. (Original) The system of claim 17, wherein the controller further defines a manufacturing model that describes a baking process for masks.

23. (Original) The system of claim 17, wherein the controller further defines a manufacturing model that describes a developing process for masks

24. (Original) The system of claim 17, wherein the controller further defines a manufacturing model that describes an etching process for masks.

25. (Currently amended) The system of claim 17, wherein the controller further performs steps of:

acquiring an inspection result of a preceding process run, wherein the inspection result is an after-strip inspection result;

determining a forward modification data according to the first ~~production~~ process data~~["first production data" lacks antecedent basis]~~ and the inspection result;

determining a re-etch manufacturing model according to the forward modification data; and

performing a re-etch process run of the first mask as defined by the re-etch manufacturing model.

26. (Original) A mask fabrication system, comprising:

a processing tool;

a monitor for monitoring an operating condition of the processing tool;

a controller for determining an operating standard of the processing tool and comparing it with the operating condition thereof, and adjusting the processing tool accordingly.

27. (Original) The system of claim 26, wherein the processing tool is a writer, baker, developer, etcher, or photoresist stripper.

28. (Original) A computer readable storage medium for storing a computer program providing a method for controlling mask fabrication using statistical process control analysis, the method comprising:

receiving a material, device and first process data of a mask;

defining a first manufacturing model according to the material and the device data;

determining a backward modification data according to the material, the device, and the first process data; and

modifying the first manufacturing model according to the backward modification data to obtain a second manufacturing model; and

issuing a process command, which directs a tool to process a second mask according to the second manufacturing model.

29. (Original) The storage medium of Claim 28, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a writing process for masks.

30. (Original) The storage medium of Claim 28, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a baking process for masks.

31. (Original) The storage medium of Claim 28, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a developing process for masks.

32. (Original) The storage medium of Claim 28, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes an etching process for masks.

33. (Currently amended) The storage medium of Claim 28, wherein the method further comprises:

receiving an inspection result of a preceding process run, wherein the inspection result is an after-strip inspection result;

determining a forward modification data according to the first ~~production~~ process data and the inspection result;

determining a re-etch manufacturing model according to the forward modification data; and

issuing a re-etch command, which directs a tool to re-etch the first mask according to the re-etch manufacturing model.

34. (Original) A computer readable storage medium for storing a computer program providing a method for controlling mask fabrication using statistical process control analysis, the method comprising:

receiving a manufacturing model;

performing a fault detection analysis to reduce a bias in the manufacturing model;

generating a fine-tuning signal in response to a result of the fault detection analysis; and

adjusting the process run operation according to the fine-tuning signal.

35. (Original) The storage medium of Claim 34, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a writing process for masks.

36. (Original) The storage medium of Claim 34, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a baking process for masks.

37. (Original) The storage medium of Claim 34, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes a developing process for masks.

38. (Original) The storage medium of Claim 34, wherein the manufacturing model defining step further comprises defining a manufacturing model that describes an etching process for masks.